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Illicit Opioid Use in Canada: Comparing Social, Health, and Drug Use Characteristics of Untreated Users in Five Cities (OPICAN Study)

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ABSTRACT *Most of the estimated 125,000 injection drug users (IDUs) in Canada use illicit opioids and are outside treatment (i.e., methadone maintenance treatment). Empirical data suggest that illicit opioid users outside treatment are characterized by various health and social problem characteristics, including polydrug use, physical and mental morbidity, social marginalization, and crime. Although required for evidence-based programming, systematic information on this specific substance-user population is sparse in Canada to date. This article presents and compares key characteristics of population of illicit opioid users outside treatment in five cities across Canada (OPICAN cohort). Overall, the majority of OPICAN participants regularly used both a variety of illicit opioids and cocaine or crack, reported physical and mental health (e.g., mood disorder) problems, lacked permanent housing, were involved in crime, and had their “ideal” treatment not available to them. However, key local sample differences were shown, including patterns of heroin versus prescription opioid use and levels of additional cocaine versus crack use as well as indicators of social marginalization. Illicit opioid user population across Canada differ on key social, health, and drug use indicators that are crucial for interventions and are often demonstrated between larger and smaller city sites. Differentiated interventions are required.*

KEYWORDS *Canada, Comorbidity, Dependence, Health, Heroin use, Illicit opioid use, Infectious disease, Methadone treatment, Polydrug use, Treatment.*

INTRODUCTION

Canada is home to an estimated 80,000–125,000 injection drug users (IDUs), the vast majority of which is estimated to use illicit opioids.^{1,2} Empirical information on illicit opioid user populations in the Canadian context is sparse, although it is highly important for policy and program development; available data are typically

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limited to data from the large cities and/or limited to treatment populations.^{3,6} A review of the available patchwork of recent local illicit drug user populations in Canada suggests that such populations consist predominantly of IDUs, who are characterized by multiple health, drug use, and social problems;^{3,7–10} however, such descriptions also suggest major differences between these populations. For example, drug overdose, infectious diseases such as human immunodeficiency syndrome (HIV) and hepatitis C (HCV), and cocaine injection prevalence levels have been reported to be more concentrated in the large urban centres, with Vancouver typically presenting the highest levels.^{9–12} Little such indicator data have been available from other—smaller—locations within Canada for systematic comparison and the development of needs-based interventions as increasingly employed in other jurisdictions (e.g., Switzerland, Netherlands, Australia).^{13–16}

Worldwide, illicit drug use is a major contributor to the overall burden of disease; it is associated with increased mortality, morbidity, and disability. Morbidity occurs primarily through infections and infectious diseases (i.e., HIV, HCV, HBV);¹⁷ premature mortality is caused by overdose, suicide, HIV/AIDS, and end-stage liver disease. It is estimated that injection drug use (IDU) alone is associated with 0.4% of deaths and 0.8% of disability adjusted life years worldwide.^{17,18} In Canada as well as in many other countries, a substantive share of new HIV infections and most of the new HCV infections are associated with IDU.¹⁹ International research evidence suggests a substantive societal, morbidity, and mortality burden associated with illicit opioid use and specifically among those users outside treatment.^{20,21} However, this evidence also points to an increasingly diversified and heterogeneous picture of illicit opioid use populations, with implications for both intervention needs and prospects. Specifically, illicit opioid users are at risk for drug overdose death.^{22–25} Most illicit opioid users have injection histories, are infected with infectious disease including HCV, or engage in risk behaviours for infectious disease (i.e., HIV).^{26,27} Increasingly, noninjection modes of illicit opioid use are being reported in different settings, resulting in lower levels of risk related to injection.^{28–30} Besides infectious diseases, illicit opioid user populations typically have high prevalence of psychiatric comorbidity as well as polydrug dependence.^{31–34} Many illicit opioid users generate revenue for their considerable drug expenditures through criminal activities and/or social support sources, thus also incurring major societal cost.^{35,36} A recent cost-of-illness analysis of a local sample of illicit opioid users in Toronto found a social cost burden of \$45,000 per untreated user/year.²⁰

In Canada and globally, methadone maintenance treatment (MMT) is currently the main treatment response for opioid dependence.^{21,37} MMT has been shown to improve physical and mental health status, to reduce illicit drug use, infectious disease risks, and crime involvement among those retained in treatment.^{37–40} In Canada, the availability of MMT for individuals using heroin as well as other forms of illicit opioids has substantially increased in the three large provinces of British Columbia (BC), Ontario, and Quebec, specifically in their main urban centres, in the past decade.^{41,42} Yet, MMT practices vary considerably (e.g., “high threshold” vs. “low threshold” or “maintenance” vs. “abstinence” approaches) between and within these jurisdictions.^{43,44} Despite recent increases in availability, the utilization of MMT is low in Canada overall compared with many other Western countries; only about 25 to 30% of the estimated illicit opioid user population are utilising MMT at any given time.^{21,45} Alternative opioid maintenance treatments existing elsewhere—such as buprenorphine, or heroin prescription—are not currently available as regular treatment options in Canada.^{21,46}

Given the lack of comparable data on illicit opioid user populations in sites across Canada and the essential importance of such information for needs and evidence-based intervention planning, a multisite cohort study of untreated illicit opioid users in the five cities of Vancouver, Edmonton, Toronto, Montreal, and Quebec City ("OPICAN" study) was established. The principal objectives for this study are (1) to assess the key characteristics and behaviours of untreated illicit opioid use in different local settings across Canada and (2) to monitor these indicators over time. The OPICAN study is an ongoing project component of a multiyear "Interdisciplinary Health Research Team" focusing on "Illicit Opiate Addiction Research, Treatment and Policy" (funded by the Canadian Institutes of Health Research) CIHR; other interlinked project components include animal studies, meta-analyses, and clinical feasibility studies, all targeted towards a final synthesis of results with the aim of context-specific prevention and treatment development.⁴⁷

METHODS

The OPICAN study is being conducted in the five study sites according to a uniform study protocol. To be eligible for study entry, individuals must (1) use illicit opioids on the majority of days per week and have done so for at least 1 year, (2) not have been in a drug treatment program in the previous 6 months, and (3) be at least 18 years old. Study sites used snowball recruitment techniques (by way of flyers, posters, community liaisons, and word-of-mouth); interested potential study participants were screened for eligibility according to a standard screening protocol administered in person or by telephone. Those persons deemed eligible were invited to the local study office, where they provided informed consent for the study as well as contact information for follow-up purposes. The study received ethical review board approval in all participating local institutions; however, no approval was given for the saliva antibody test component in Edmonton.

All participants completed a saliva confirmation drug test for opioid use. We ensured anonymity and confidentiality of the data collected and paid a subject fee of CDNS 20. Each participant was given a unique study code and identifier for follow-up and data processing purposes. For the baseline component, the following subject assessment components were implemented:

- (1) Semistructured, interviewer-administered questionnaire on social, health, drug use, crime, and treatment characteristics (open and closed-ended items).
- (2) Saliva immunoassay screen test for HIV antibodies (Biochem Detect v 1 screen test and Vironostika HIV1 Micro Elisa confirmation test) and HCV antibodies (Ortho Diagnostic HCV 3.0 SAvE Elisa screen test and Bio-Rad Monolisa anti-HCV Plus version2 confirmation test):^{48,49} sensitivity and specificity values for tests for both virologic antibody strands are somewhat limited [HIV: depending on the population, collection, and testing method used, sensitivity ranges from 97.2–100%, specificity ranges from 97.7–100%.^{50,51} HCV: sensitivity values for method used have been reported at 81% (range: 72–88%), specificity at 98% (range: 89–100%);^{48,52} these values were confirmed with a small saliva/blood serum confirmation sample from 20 external subjects] and upward adjustment of cut-off value has likely led to underreporting for HCV; however, the practical feasibility and

acceptance benefits of the salivary testing methods with the specific research population and setting compensated for these limitations.

- (3) Composite International Diagnostic Interview (CIDI)–Short Form (Depression)⁵³

Baseline data reported in this article were collected between March and December, 2002. Six hundred seventy-nine participants were enrolled, with enrolment caps for each site [Caps were N=200 for the larger cities (i.e., Montreal, Toronto and Vancouver), and N=100 for the smaller cities (Edmonton and Quebec City)]. Data from component 1 and 3 were locally entered into a standardized data entry shell and then centrally cleaned and analysed; saliva antibody samples for component 2 were analysed at the Public Health Laboratory of the Ontario Ministry of Health and Long-term Care. Results from component 2 were provided by study identification code and entered into the central study database. Statistical analyses were conducted using SPSS,⁵⁴ using study site as the major independent variable. In testing for differences between sites, the method used was based on the scaling level of the variable under consideration: analyses of variance (ANOVA) for metric data, Kruskal–Wallis and median tests where the assumptions of ANOVA failed, and table analyses for categorical data. Statistical significance was defined at the 5% level. For cross-tabulations resulting in an overall significant Pearson chi-square, the highlighted differences between cities have a minimum adjusted standardized residual of 2.0.

The OPICAN cohort will be monitored in several follow-up waves, initially until 2005.

RESULTS

Social, Economic, and Legal Characteristics

Table 1 summarizes that, on average, cohort participants were in their mid-30s; only the Montreal sample was slightly younger with a mean age of under 30 years. Two thirds of the cohort sample were male. Most of the participants in the cohort were white, although this proportion differed across sites; both Vancouver and Edmonton had a substantial Aboriginal group of almost one third of the overall sample in their respective subcohorts. More than half of the cohort did not have permanent housing, but lived in transitional housing or on the street; greatest differences existed between Quebec City, where three quarters of participants were permanently housed, and Vancouver, where three quarters of participants were not permanently housed.

The largest proportion of participants—about one quarter—with legal income from paid work were found in Montreal and Toronto; Vancouver had the smallest with about 6%. The main sources of income generation (by amounts generated) for the total cohort were semilegal activities (including panhandling, hustling, and sex work), drug dealing, and government support payments (welfare, social assistance, etc.).

About half of the overall cohort on average were arrested in the previous year, with just under 6 in 10 in Vancouver and just over 4 in 10 in Toronto. Most arrests were for property offences, whereas arrests for drug offences played a relatively minor role. A slightly smaller proportion of the overall cohort had been in detention in the previous year, with subcohort extremes of just over half in Vancouver and

TABLE 1. Social, economic, and legal characteristics (by city and total)

Characteristic	Percent (number)					
	Edmonton (n = 93)	Montreal (n = 157)	Quebec City (n = 87)	Toronto (n = 141)	Vancouver (n = 201)	Overall (n = 679)
Mean age, years (\pm SD) [†]	39.1 (6.8)	29.0 (9.3)*	35.1 (8.9)	38.3 (8.7)	34.6 (8.9)	34.8 (9.4)
Female	30.1 (28)	26.1 (41)*	31.0 (27)	30.0 (42)	43.9 (87)*	33.3 (225)
Ethnicity						
White	54.8 (51)*	88.5 (139)*	95.4 (83)*	75.9 (107)*	40.7 (81)*	68.1 (461)
Aboriginals	31.2 (29)*	1.3 (2)*	3.4 (3)*	6.4 (9)*	32.7 (65)*	16.0 (108)
Other	14.0 (13)	10.2 (16)	1.1 (1)	17.1 (25)	26.6 (53)	16.0 (108)
Housing						
Permanent	53.8 (50)	52.2 (82)*	74.7 (65)*	41.8 (59)	25.4 (51)*	45.2 (307)
Nonpermanent	46.2 (43)	47.8 (75)*	25.3 (22)*	58.2 (82)	74.6 (150)*	54.8 (372)
Received legal paid work income	26.9 (25)	26.3 (41)*	23.0 (20)	27.7 (39)*	6.1 (12)*	20.3 (137)
Arrested past 12 months	54.8 (51)	47.1 (74)	41.4 (36)	41.8 (59)*	59.2 (119)*	49.9 (339)
In detention past 12 months	42.5 (37)	35.0 (55)*	32.6 (28)	42.9 (60)	51.0 (102)*	42.1 (282)
Under judicial restraint [‡]	84.8 (78)*	57.5 (89)*	48.2 (41)*	83.7 (118)*	74.1 (149)	70.4 (475)

Missing data affect cell counts for some variables.

*Minimum adjusted standardized residual of 2.0.

[†]Anova was performed, and because of unequal variances, the Kruskal–Wallis (Mean rank = 218.4, $\chi^2 = 99.44$, $df = 4$, $P < .005$) and median test (median = 36, $\chi^2 = 60.43$, $df = 4$, $P < .005$) were also performed.

[‡]Including criminal record, being on probation or under bail, bench warrant or pending charges.

just over one third in Montreal. In all sites except for Quebec City, the vast majority of participants were under some form of criminal justice restraint (probation, criminal record, parole, etc.).

Drug Use and Injection Risks

Table 2 summarizes that drug use patterns were rather diverse across the five local cohort populations. In the previous 30 days, heroin was the most commonly used opioid drug; it was used by a substantive majority in Vancouver and Montreal, by about half of the participants in Toronto, but by only a minority of participants in Edmonton and Quebec City. Of other opioids, hydromorphone use was most common in Quebec City, Edmonton, and Toronto, but only reported by a small minority in Vancouver and Montreal. Codeine substances were used by the majority in Toronto and Edmonton, but least commonly in Vancouver and Montreal. The use of street methadone was reported by almost one third in Toronto; use of “other” prescription opioids (e.g., meperidine, morphine, oxycodone) was reported by vast majorities in Toronto and Edmonton but by only small minorities in the other three sites.

For nonopioid drugs, most of the overall sample reported using cocaine and crack, but the usage differed considerably across sites. Cocaine use was reported by vast majorities of the local samples in Quebec City and Montreal, whereas crack use was reported by majorities in Vancouver, Edmonton, and Toronto. Majorities of participants in all sites reported combined use of opioid and nonopioid drugs (e.g., “speedballs” consisting of heroin and cocaine combinations).

Considerable variation across sites existed with respect to routes of drug administration. The vast majority of cohort participants had a lifetime injection history, yet the current prevalence of injecting drugs (i.e., in the previous 30 days) ranged from less than two thirds of participants in Toronto to more than 9 out of 10 participants in Vancouver.

A minority of subjects—with a range of less than 1 in 10 in Vancouver to more than 2 in 10 in Montreal—reported the sharing of needles in the previous 30 days; injection equipment was shared in the previous 30 days by about one quarter of the overall cohort. Somewhat less than 1 in 5 participants across the cohort reported experiencing a drug-related overdose in the previous 6 months.

Health Status

The best “personal health” status was indicated by the Montreal sample with a “good or better” rating by almost 6 in 10, whereas the Toronto sample reported the worst health status with a “fair or poor” rating also by almost 6 in 10 participants. (Table 3) The most participants in Edmonton and Toronto and the least in Montreal and Quebec City stated that they had a physical health problem. Among those citing health problems, hepatitis and pain were cited overall as the two single most serious physical health problems, reported most frequently in Vancouver (hepatitis) and Quebec City (pain). On the basis of the results of salivary testing, HIV antibody positivity was greatest in Vancouver with over 1 in 5 participants; Vancouver (2 in 3 participants) and Quebec City (3 in 5) were the two sites indicating the majority of cohort participants to be HCV antibody positive (Edmonton excluded from this component of analysis).

Mental health problems, in the form of mood disorders, were self-reported by about two thirds of the cohort; anxiety disorders were self-reported by about 1 in 10 participants in the overall cohort. Standardized assessment for depression using

TABLE 2. Drug use and injection risks in past 30 days (exceptions noted)

Drug use and injection variables	Percent (number)				
	Edmonton (n = 93)	Montreal (n = 157)	Quebec City (n = 87)	Toronto (n = 141)	Vancouver (n = 201)
Overall (N = 679)					
Opioids					
Heroin	28.0(26)*	89.8(141)*	36.8(32)*	52.5(74)*	91.0(183)*
Hydromorphone	49.5(46)*	23.6(37)*	86.2(75)*	41.8(59)*	3.5(7)*
Codeine	50.5(47)*	12.1(19)*	24.1(21)	68.8(97)*	18.4(37)*
Street methadone	28.0(26)	17.2(27)	11.5(10)	31.2(44)*	18.4(37)
Other opioids†	83.9(78)*	21.0(33)*	37.9(33)*	84.4(119)*	10.9(122)*
Nonopioids					
Cocaine	35.5(33)*	68.8(108)*	79.3(69)*	46.1(65)*	47.8(96)*
Crack	66.7(62)*	28.0(44)*	3.4(3)*	62.4(88)*	86.6(174)*
Combined opioids with nonopioid drugs	69.9(65)	64.1(100)*	60.5(52)*	71.6(101)	79.1(159)*
Injected drugs					
Lifetime	100.0(93)*	91.1(143)	96.6(84)	86.5(122)*	96.5(194)*
Past 30 days	89.2(83)	89.5(128)	91.7(77)	64.8(79)*	92.8(180)*
Shared a needle	15.7(13)	22.0(28)*	15.6(12)	6.3(5)	7.8(14)*
Shared injection equipment	30.1(25)	31.3(40)	24.7(19)	27.8(22)	21.3(38)
Overdose past 6 months	19.4(18)	17.8(28)	18.6(28)	19.9(28)	14.9(30)

Missing data affect cell counts for some variables.

*Minimum adjusted standardized residual of 2.0

†Meperidine, treatment methadone, other opioids.

TABLE 3. Health (by city and total)

Health Characteristics	Percent (number)					
	Edmonton (n = 93)	Montreal (n = 157)	Quebec City (n = 87)	Toronto (n = 141)	Vancouver (n = 201)	Overall (N = 679)
Personal health assessment						
Good or better	48.4 (45)	59.6 (93)*	51.2 (44)	42.6 (60)	46.7 (91)	49.6 (333)
Fair or poor	51.6 (48)	40.4 (63)*	48.8 (42)	57.4 (81)	53.3 (104)	50.4 (338)
Reported a physical health problem	91.4 (85)*	54.1 (85)*	58.6 (51)*	85.1 (120)*	66.7 (134)	70.0 (475)
Most serious problems						
Hepatitis	42.4 (36)	16.5 (14)*	17.6 (9)*	30.0 (36)	47.8 (64)*	33.5 (159)
Pain	10.6 (9)	20.0 (17)	29.4 (15)*	15.8 (19)	9.0 (12)*	15.2 (72)
Infectious disease tests (saliva)						
HIV antibody positive†	not requested	12.9 (20)	11.8 (10)	14.8 (19)	20.3 (39)*	15.7 (88)
HCV antibody positive‡	not requested	35.3 (49)*	59.5 (47)	48.8 (61)*	66.3 (114)*	52.6 (271)
Reported a mental health problem	58.1 (54)*	24.8 (39)*	26.4 (23)	45.4 (64)*	19.0 (38)*	32.2 (218)
Most serious problems						
Mood disorder	62.3 (33)	71.8 (28)	56.5 (13)	62.5 (40)	68.4 (26)	64.5 (140)
Anxiety disorder	13.2 (7)	10.3 (4)	0.0 (0)	18.8 (12)	10.5 (4)	12.4 (27)
CIDI-SF Depression Survey						
Depressed	50.6 (45)	58.6 (92)*	58.6 (51)	53.9 (76)	33.7 (67)*	49.2 (331)

Missing data affect cell counts for some variables. CIDI-SF, Composite International Diagnostic Interview–Short Form.

*Minimum adjusted standardized residual of 2.0.

†n = 560 excludes indeterminate results.

‡n = 515 excludes indeterminate results.

the CIDI-SF instrument resulted in a positive screening result for most of the participants in all sites except for Vancouver, where this was the case for only one third of participants.

Health and Social Service Utilization

Health care services were being received by substantial majorities of participants in Edmonton and Toronto, yet only by a minority in Montreal; the health care received was rated “good or better” by two thirds or more in local samples. (Table 4) In the previous 6 months, walk-in clinics were used most in Edmonton and Vancouver and least in Quebec City and Toronto; emergency rooms were used by about half the overall cohort; private physicians were used most in Toronto and Quebec City and least in Montreal and Vancouver. Needle exchange services (fixed) were accessed by clear majorities of participants in all sites except for Toronto. For other social services, welfare offices were used most often in Vancouver and least in Montreal and Quebec City; drop-in shelters were used by vast majorities of participants except for the Montreal and Quebec City sites, where only a minority proportion utilized such facilities.

Drug Treatment

The greatest proportions of participants in Edmonton and Montreal, and the smallest proportions of participants in Vancouver, Quebec City, and Toronto, had involvement in any drug treatment program in the year prior to study entry. (Table 5) Somewhat less than half of all participants with such a treatment history in the overall cohort had been involved in MMT. Less than one third of the overall cohort stated that they wanted to be in an MMT program. A minority of cohort participants had tried or wanted to enter some form of drug treatment in the previous year but had been unable to access treatment. Clear sample majorities in Toronto and Edmonton, yet only minorities in the other three sites, indicated that there was an “ideal” form of treatment (meeting their self-perceived distinct treatment needs or preferences) that they would be willing to enter and utilize if it were available.

DISCUSSION

Our OPICAN study findings present a unique systematic comparison of key characteristics and behaviours of illicit opioid users outside treatment in five urban study locations across Canada. The most important finding, overall, is that the five local opioid user samples assessed differ considerably on most key indicators evaluated in this study; this underlines the great need for locally accentuated and needs-based interventions.

Concretely, our study presents a couple of important findings about differential drug use patterns: First, the use of illicit opioids in the OPICAN cohort is by far not limited to heroin but includes a wide variety of prescription opioids (including diverted methadone). In Edmonton and Quebec City, for example, the primary opioid drugs used were, in fact, prescription opioids. This may be related to the dynamics of local drug cultures, or illicit drug markets in smaller locales, in which prescription opioids substitute for limited heroin supply. This observation coincides with reports of extended diverted prescription opioid use in urban centres across North America and elsewhere,^{55–57} emphasising the need for further investigation.

TABLE 4. Health and social service utilization (by city and total)

Health care	Percent (number)					Overall (N = 679)
	Edmonton (n = 93)	Montreal (n = 157)	Quebec City (n = 87)	Toronto (n = 141)	Vancouver (n = 201)	
Currently receiving health care	78.5 (73)*	35.7 (56)*	50.6 (44)	63.1 (89)*	53.2 (107)	54.3 (369)
Assessment of health care quality†						
Good or better	77.5 (55)	75.0 (42)	65.1 (28)	74.2 (66)	69.5 (73)	72.5 (264)
Fair or poor	22.5 (16)	25.0 (14)	34.9 (15)	25.8 (23)	30.5 (32)	27.5 (100)
Most common medical services used						
past 6 months						
Walk-in clinic	67.7 (63)*	41.7 (65)	34.5 (30)*	39.0 (55)*	55.7 (112)*	47.9 (325)
Emergency room	51.6 (48)	46.8 (73)	59.8 (52)	44.7 (63)	42.3 (85)	47.3 (321)
Private physician	47.3 (43)	28.2 (44)*	59.8 (52)*	66.7 (94)*	20.4 (41)*	40.5 (274)
Most common social services used						
past 6 months						
Needle exchange (fixed)	81.7 (76)*	69.9 (109)	70.1 (61)	46.8 (66)	87.1 (175)	71.8 (487)
Welfare office	54.8 (51)	48.7 (76)*	31.0 (74)*	52.5 (74)	74.1 (149)*	55.6 (377)
Drop-in shelter	67.7 (63)*	27.6 (43)*	8.0 (7)*	78.0 (110)*	58.7 (118)*	50.3 (341)

Missing data affect cell counts for some variables.

*Minimum adjusted standardized residual of 2.0.

†Of those currently receiving healthcare.

TABLE 5. Drug treatment (by city and total)

Drug treatment	Percent (number)					
	Edmonton (n = 93)	Montreal (n = 157)	Quebec City (n = 87)	Toronto (n = 141)	Vancouver (n = 201)	Overall (N = 679)
In drug treatment past 12 months	46.2 (45)*	38.9 (61)*	18.4 (16)*	19.1 (27)*	18.5 (37)*	27.1 (184)
In methadone maintenance treatment program†	46.5 (20)	57.4 (35)	37.5 (6)	18.5 (5)*	45.9 (17)	45.1 (83)
Tried or wanted to be in drug treatment but could not in past 12 months	28.6 (26)	25.8 (40)	33.3 (29)	31.2 (44)	28.3 (56)	29.0 (195)
Want to be in a methadone or buprenorphine maintenance treatment program	32.2 (29)	32.9 (49)	34.9 (29)	22.0 (31)	36.2 (72)	31.7 (210)
Have an ideal treatment preference that respondent wishes was available	68.8 (64)*	43.6 (68)*	42.5 (37)*	73.8 (104)*	47.4 (93)*	54.4 (366)

Missing data affect cell counts for some variables.
*Minimum adjusted standardized residual of 2.0.
†Of those in drug treatment in past 12 months.

Secondly, illicit opioid use in our study cohort is intricately linked to regular cocaine or crack use, or the use of opioid/cocaine combinations, although fundamental local differences again exist with regards to specific drug use profiles.^{31,58,59} In this context, again, a key question is whether these pattern differences are driven by local market, drug culture, or individual preference dynamics, as they also entail considerable differences for ensuing health (i.e., injections) risks and harms. The documented varying polydrug use profiles also have major implications for the nature of opioid treatment programs as currently offered (i.e., MMT), many of which still exclude or penalise regular cocaine/crack users.

It should be further highlighted that in specific sites (e.g., Toronto), a substantial number of participants primarily use their opioid drugs by noninjection routes of administration (i.e., oral and smoking). This mirrors recent observations in some other jurisdictions^{60,61} and has major implications for prevention and treatment. Further analyses will have to focus on the determinants and consequences (e.g., infectious disease status) of these behaviour patterns, and how these can be utilized in intervention efforts.^{29,30,62} The OPICAN cohort, overall, presented high HCV and HIV prevalence levels. In conjunction with these infectious disease indicators, it should be of concern that many study participants still reported the sharing of needles and, even more so, injection equipment.⁶³ In times where needle exchange services are broadly available in the study sites, the remaining barriers for such risk reduction measures in the study population must be investigated and addressed.^{61,62}

Considering wider social determinants of drug use and health, our study documents that a majority of the OPICAN participants were not permanently housed, drew substantively from semilegal or illegal income sources, and had criminal justice system (including detention) exposure. Thus, they are characterized by conditions of social marginalization as well as exposure to risk environments which have been demonstrated widely to be associated with inferior health status or outcomes.^{66–69} It is notable, however, that on a number of health status characteristics assessed in our study, participants in the (province of) Quebec sites fared somewhat better compared to the other sites. Further investigations will have to explain the determinants and consequences of this difference on key risk and health outcomes, especially in light of the fact that participants from the two Quebec sites also reported overall levels of health and social care utilization, overall, compared to other sites.

Participants reported an overall high level of burden of both physical health (infectious disease, pain, other) and mental health (depression) problems, confirming that “opioid dependence” predominantly occurs in connection with a multitude of comorbidities and needs to be addressed as such.^{32,70–72} This situation is emphasized by the result that half of the cohort rated their health status to be “fair” or “poor”, gauging their health status far below the Canadian general population, among whom only 12% report such status.⁷³ Importantly, a number of the comorbidities (e.g., depression) reported in the OPICAN sample have been shown to negatively influence addiction treatment prospects or outcomes.^{74,75} At the same time, drug dependency hinders many individuals from access to general health care or receiving specialized care (e.g., HCV treatment).^{76,77} Further analysis also needs to explore specifically to which extent the cooccurrence of opioid and cocaine/crack use is associated with psychiatric comorbidity status (and thus may be driven by potential dynamics of “self-medication”) among cohort participants,⁷⁸ and to what extent these specific polydrug use patterns and resulting intervention needs are not met by existing treatment services.

Given the picture of OPICAN participants' drug treatment histories as well as the limited interest in existing treatment options, our study seems to confirm that the currently existing opioid treatment landscape in Canada—consisting predominantly of MMT—is vastly insufficient.^{21,45} Reasons for the very limited utilization of existing treatment options may lie in the distinct needs of users as well as in the current structures or practices of treatment programs.⁷⁹ However, given the substantial social and health burden from illicit opioid use not effectively reached by treatment as well as the desire expressed for more suitable (“ideal”) treatment by many participants, a determined needs-based expansion of treatment options must urgently occur.

As one key limitation of the OPICAN study, it needs to be pointed out that illicit opioid use is a typically hidden activity and occurs in locally and behaviourally dispersed subpopulations; the representativeness and generalisability of our study results for the phenomenon of illicit opioid use in its entirety in the sites examined, or for Canada as a whole, are thus limited. However, studies of untreated drug user populations are important for complementing information derived from treatment-population samples, which are often primarily relied on for intervention planning.

Overall, findings from the OPICAN study aim to facilitate the development of locally specific and needs-based prevention and treatment interventions for illicit opioid users; this is also the primary purpose of the Interdisciplinary Health Research Team project's (already initiated) knowledge synthesis component. An improved prevention—including context and local population specific “harm reduction” measures—and treatment landscape for illicit opiate users in Canada is urgently required.

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